THE IMPACT OF DETRAINING ON THE RESPIRATORY AND VO_2MAX OF FEMALE'S PLAYERS: APPLIED STUDY ON FEMALE VOLLEYBALL PLAYERS IN KARAK DIRECTORATE OF EDUCATION.

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ABSTRACT*: The aim of this study is to find out the impact of the detraining on the degree of respiratory adjustment among female volleyball players. The respiratory rate variable and the maximum oxygen consumption are measured by adopting two experimental and control groups to identify detraining impact. The study uses a sample of (35) female students from secondary schools in Karak area. The sample is selected from the study population to conduct pre-test (On-training) and post-test after (6) weeks without any training for experimental purpose. The results show that there are statistically significant differences between the pre-test results and post-test tests and for the benefit of the pre-test, and these differences have a statistical effect as indicated by the results.*

1. INTRODUCTION

Volleyball is one of the fun and exciting multiplayer games, which has achieved great popularity and widespread in the world, especially in recent years. There have been many changes, whether changes in tactical methods and evolution, or changes to the rules of the game that have contributed to the development of volleyball for the better [1].

Each sports game has its own physical characteristics, and therefore requires players to have many different skills in volleyball such as strength, speed, flexibility, agility and endurance in order to integrate performance and rise to high levels[1, 2]. Explosive strength is one of the important qualities a player needs in volleyball. Having this capacity, the player will be able to execute the skills in an elaborate and good manner, but in case of loss, he /she will not be able to master the skill of attacking, crushing attack and blocking wall. Therefore, this study aims to determine the impact of detraining on the ability of the respiratory system to keep up with the game and adapt to the respiratory rates necessary for female volleyball players.

The physical abilities of an individual are controlled by many factors, and aerobic

capacity is as important as other physical abilities. Thus, a lot of research has been concerned with the factors that give us an athlete with air power, and this ability is reflected in the maximum consumption of oxygen, VO2max where there is no sport or athlete does not give much importance to this physiological standard [3, 5, 6].

2. Literature Review:

The respiratory system is a vital organ in sports training, as it expresses physical effort and the associated training loads of varying intensity. It is one of the indicators on the intensity of training loads and is defined as the number of times that the chest rises in a minute[13].

The respiratory rate and volume of breathing are among the most important variables in increasing or decreasing pulmonary ventilation. Depending on the intensity and volume of that effort, the respiratory rate is affected by several factors, including the respiratory muscles as the main facilitator in the movement of air in and out of the lungs, as the process of breathing [12].

The process of breathing process involuntary controlled by the nervous system through neurological centers in the brain. There are factors that affect the speed of the process of breathing chemicals such as the factors which is an increase Carbon Dioxide in the arterial blood and increase the pH and lack of its blood, as are the chemical receptors that are located outside The central nervous system is sensitive to the change in oxygen, carbon dioxide , H+ concentration[24, 25] and the increase of temperature of the body or the temperature of the surrounded environment [7, 8]. The respiratory rate varies depending on the age of the players, the effort they exert, as well as the overall health condition [20, 21, 23]. When breathing is good, especially for handball players, it has helped them quickly return to normal status. During or during the training modules.

The process of breathing process involuntary controlled by the nervous system through neurological centers in the brain[3]. There are factors that affect the speed of the process of breathing chemicals such as the increase of second gas dioxide in the arterial blood, the increase of H+ and lack of PH in the blood [13]. The chemical receptors, which are outside the central nervous system are sensitive to changes in oxygen, carbon dioxide and H+ concentration [14, 15]. The temperature also increases the rate of respiration when the temperature of the body or the surrounding environment increases. The respiratory rate varies depending on the age of the players, the effort they exert, as well as the overall health condition (Salama, 1989, 211). During or during the training modules[12,13].

When expressing the level of aerobic fitness, one of the most common terms used in the field of sports physiology and physical effort is the maximum oxygen consumption symbolized by the symbol VO_2max, where V refers to the volume of oxygen per minute and O_2 is the volume of oxygen and max is the maximum size (). VO_2max is defined as the maximum oxygen that can be obtained by the body through the outside air and directed to the muscles that consume it and is also expressed by the maximum oxygen that the body consumes in a certain period of time. For example, if VO_2max is 3 liters per minute, this person can consume 3 liters of oxygen per minute. The differences in oxygen

consumption are significantly related to weight [4, 2], and therefore differences in weights should be considered when comparing.

In training, oxygen consumption increases about 10 to 20 times, especially in high-intensity endurance exercises. During physical activity, it reaches 2.5-6 liters per minute. It is also affected by sex, where it rises in males from 15 to 30% compared to females. Measurement is done in several direct and indirect ways. One of the most prominent of these field methods is the Cooper test, which was developed by scientist Kenneth H. Cooper in 1968. As indicated [9,10, 11], the test is conducted on the athletics track using a timer, whistle, and funnel set, where the player is running the largest distance possible within 12 minutes, and then the maximum oxygen consumption is calculated by the following equation

VO_2 max = 22.31 × d - 11.2, *where d is the distance in KM*.

Figure 1 shows the VO2max uptake scale for female players according to Cooper.

Maximal oxygen uptake norms for women (ml/kg/min)

	Age (years)					
rating	18-25	26-35	36-45	46-55	56-65	65+
excellent	> 56	> 52	> 45	> 40	> 37	> 32
good	47-56	45-52	38-45	34-40	32-37	28-32
above average	42-46	39-44	34-37	31-33	28-31	25-27
average	38-41	35-38	31-33	28-30	25-27	22-24
below average	33-37	31-34	27-30	25-27	22-24	19-21
poor	28-32	26-30	22-26	20-24	18-21	17-18
very poor	< 28	< 26	< 22	< 20	< 18	< 17

Figure1. VO_2max uptake scale for female players according to Cooper.

3. Problem Statement

Volleyball has recently witnessed a great development in all aspects of physical, skill, planning and psychological. It is also known that basic volleyball skills are the backbone of this game and that progress in the level of technical performance is through the education and training of these skills in accordance with the rules of some mechanical principles. Therefore, Sports training leads to physiological adaptations in the body's organs that are appropriate to the nature of performance. These physiological adaptations can occur within a period of 6-10 weeks of appropriate physical training in terms of type and quantity. Adaptation also varies from person to person and is also limited, so too much training can lead to little development, and in some cases, can hinder physiological adaptation, hence the volume of training is exciting to improve physical performance. It may increase, and therefore can cause problems and troubles for the player such as fatigue, symptoms of over training or low physical performance [17].

From here we have to know what happens to athletes after stopping the physical training process, either because of injury or because they undergo surgery, or because of the end of the sports season and others, this is called the interruption of training (Detraining)[18].

Different volleyball skills require appropriate breathing rates to perform these skills properly. Hence the problem of the study is to measure the impact of the interruption of female volleyball players from training on the adaptation of their respiratory system when playing again [19].

4. The Aim of Research

1. Determining the effect of (6 weeks) detraining on female volleyball players from on the adaptation of their respiratory system
2. Finding out the percentages of the decline of breathing rate of female volleyball players after (6 weeks) detraining.

5. Research Hypothesis:

H0: There are no statistically significant differences between the pre and post measurements of the adaptation of female volleyball players respiratory system and VO2max related to detraining.

6. Study Approach:

This study uses the one-group experimental method using pre- and post-test.

7. The study sample:

The study uses a sample of female volleyball players from secondary schools in Karak area. The sample of (15 female players) is selected from the study population to conduct pre-test and post-test after (6) weeks without any training. Table (1) indicates the characteristics of the study sample according to length, weight and age variables.

Table (1). Characteristics of the study sample (N=35)

variable	Measuring unit	Mean	Std. Deviation
Age	Year	16.8	60.0
Hight	M	1.65	0.068
weight	Kg	62.3	1.36

From the specific characteristics in table (1), it is possible to observe that the female players are almost have similar anthropometric measurements, where the standard deviation values indicate a low dispersion level around the mean of all measurements. This was considered because of the correlation of respiratory rate and oxygen consumption with age, weight and height as previous studies have shown.

8. Procedures:

To conduct this study, the following steps were performed:

1- Measuring height, weight, and age.

2- Conducting pre-test (uninterrupted training) to measure breathing rate by reading the number of times the chest Ins and Outs per minute.

3- Conducting Cooper's pre-test to find the maximum oxygen consumption rate in ML.

4- Leavening female players for 4 weeks without any exercise sports.
5- Conducting post-test (detraining) tests to obtain respiratory rate and maximum oxygen consumption.
6-

9. RESULTS

The Main hypothesis states that: There are no statistically significant differences between the pre and post measurements of the adaptation of female volleyball players respiratory system and VO_2max related to detraining.

In order to examine the first hypothesis, arithmetic means, standard deviations, and the T-test of the pre- and post-measurements were used to find differences in the dropout in both respiratory rate and maximum oxygen consumption of female volleyball players. Table (3) presents the results of the tests.

Table 3. Pre and post testes differences.

Variables	Pre-test		Post-test		t	Sig.
	Mean	St. D	Mean	St. D		
Respiratory Rate	21.23	9.07	17.28	9.06	3.95	0.002*
Vo2 max	57.2	2.36	43.3	2.56	13.9	0.001*

It is clear from table (3) that there are statistically significant differences at ($\alpha <= 0.05$) in favor of the pre-test on respiratory rate and maximum oxygen consumption of female volleyball players, where it reached on average (21.23, 17.28, 57.2, 43.3) respectively .

DISCUSSION

It is clear from the results that detraining has had a significant impact on the adaptation of female volleyball players respiratory system and VO_{2max}. Means of (21.23, 17.28, 57.2, 43.3), as shown in Table (3) prove that there are statistically significant differences at (α= 0.05) in favor of the pre-test. Respiratory rate and VO_{2max} after 1.5 months of training break, where we note a significant decrese in respiratory rate and VO_{2max}. The results of this study are consistent with a scientific review of Armellini et al [22], Thompson et al. [23] and Christkerson [24], during rest after a training break for a certain time. It also agreed with the Hardman & et al study [25]; while the current study did not agree with the momani study [26] on body respiratory system and VO2max, where the results of the momani study showed no significant differences between the pre and post measurements of the respiratory system and VO2max.

CONCLUSION

In the light of the objectives of the study presentation, its results and discussion, the researcher concludes that detraining negatively affects the adaptation of female volleyball players respiratory system and VO2max.However, this may contribute to extra weight or other variables that need future investigation.

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